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### THE TRAINING OF THE MEDICAL STUDENT.

BY

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It is the desire of the Editor of the JOURNAL that the Educational Number for the next academical year should begin with some general reflections on Medical Education as it now is; this task, a difficult task indeed, he has laid upon me. At the present time the many inquiries, controversies, and opinions on the subject, like a multitude of remedies for a disease, do but prove how unsettled are the ideas and the methods of this education, how variable the conditions of it, how vacillating our values of its means and ends. We lament the burden laid upon the student, yet each reformer begs leave to add to the pile.

#### MAIN PRINCIPLES.

In undertaking to try to unravel so tangled a subject we must endeavour to lay hold on some main principles. Three principles of all professional education seem to be fundamental: first, to secure a good general education; secondly, a good scientific education; thirdly, a good technical education. The period of each of these makes by itself a large demand; all three of them together a very large one; indeed, we are but too well aware that a complete general and medical education occupies already more than a quarter of the student's life! Before he can enter upon his career a quarter of his life is gone: let us think of that!

#### DIVERSITY OF INDIVIDUAL GIFTS.

Speaking generally, and within civil societies, individuals vary more than circumstances; in other words, out of similar circumstances individuals draw different advantages; so that although up to a certain period of life education may be laid out on broad indiscriminate lines proper for all young persons, yet for adolescents by rapid degrees it must become more and more diverse and several, dividing itself into the education of classes, of groups, and of individuals. A uniform development of all the faculties can pertain only to the earlier stages even of school life; the abilities of the older boy, as he matures, will, if he is worth much, betray some bias, in one way or another.\*

#### ACADEMIC v. TECHNICAL TRAINING.

The human child is born with potencies and capacities rather than with efficient abilities; he does not take up an independent life almost from birth, as the

chicken does. In the beginning even the very instruments of sense, action, and thought are rudimentary, and must be developed before the mind can enter upon its proper functions. Not till then can the several courses of learning be commenced; and in Man each of these again is deep and slow, and the conditions manifold and intricate. Dexterity, language, philosophy, science, technical furniture, each of these, if given its own way, might arrogate the devotion of a lifetime. Some compromises then—some trenchant compromises, must be made, and some innate capacities sacrificed. Sad to say, the all of each of us is not wanted. How then in medical education is some measure of accommodation to be made without rejecting altogether the fertilizing virtues of each element? Shall we not answer that even in some of the ancillary professional subjects we must compromise by illustrating and instilling principles, with the sacrifice of all but the most significant detail? In part perhaps we must do even more, and cut away from certain of the preliminary subjects even the principles of some divisions which, precious as they may be, are not immediately concerned with the practice of Medicine. In school mathematics, for instance, parts, such as logarithms and the calculus, are usually omitted; so again in some departments of physics experiment might be carried so far only as to illuminate the broader principles, and to implant a due respect for the universality and exactness of this department of science. In chemistry the medical student must needs go farther and deeper; both larger and lesser principles must be clothed more richly with detail; yet even here, for the ordinary curriculum, some parts may be taken more in principle than in detail: the average student need not undertake it on the scale of a "pure science." In the final courses of Medicine proper, instruction must be thorough and comprehensive, both in principle and detail. The ordinary student then may content himself with the principles of certain departments of study, but on condition that he learns a few subjects thoroughly—those that bear directly upon his profession; and these not for their practical use only, obligatory as this is, but also for intimate training in accuracy of observation and thought; that he may be forced into conflict with the rigour and complexity of natural laws and events. This discipline the ordinary student will find first in anatomy and physiology.

\* See my little book on *Professional Education* (Macmillan, 1906).

## THE SCIENTIFIC MAN AND THE "PRACTICAL" MAN.

But how is even this economical course to be distributed? I have said before, and unwillingly repeat the opinion, that we may have to provide frankly for two classes of medical men: for a class of accomplished physicians (I refuse to divide surgeons from physicians), or medical scientists such as pathologists, and another class of dexterous resourceful kindly practitioners, all-round men well equipped with sound doctrine, but without pretensions to breadth or depth, to research or erudition. This class we see around us already, a class of trustworthy competent family physicians who in difficulty can call to their aid colleagues more intimately conversant with scientific theory, or with one or more special departments of medicine. Such a primary division, both of men and function, is represented by Diploma and University degree respectively. In answer to the daily needs of social life, and the various endowments of individuals, we see the "practical man," deft, shrewd, unanalytic, untheoretic, working with the reflective, learned, widely or specially experienced colleague. The one is stationary, and his invaluable practical skill and resource largely die with him; the other is of those who extend the boundaries of knowledge. If we can educate the men of the first kind in five years, to the studies and training of those of the second kind we must add half as long a time again. Not only so, but as from boyhood talent and capacity promise to be stronger and richer, the plan of education should be the longer, wider, and more arduous. Of geniuses I do not speak; they transcend all our reckonings.

## UNIVERSITY v. TECHNICAL SCHOOL.

Not for all students then, even students of some promise, may it be worth while to take a university course with its greater cost in time and money; some very valuable members of our profession have a turn for craft rather than for intellectual study. The two varieties of boy can be discerned at school, and severally provided for. Both varieties would be the better for the amenities of a university education, even if one of them aimed at no academical distinction; but means may be scanty, and for the bookless boy no scholarships available. What must not happen is the lowering in any degree of the university standard to accommodate the less intellectual or less fortunate students. In Cambridge we often meet with students who had better not have taken a university course, but been content with a diploma, such as that of the "Conjoint Board."

## LACK OF GENERAL EDUCATION.

Not only so, but many, most perhaps, of these undergraduates who drag through our course with burden to themselves and to us, fail not so much in natural talent as by lack of that general education which, if lost in boyhood, can hardly be recovered later. The schools are improving, and improvement they certainly need. Secondary education has been shortsighted, ill planned, and dislocated: dislocated especially in the neglect of english for a factitious classicism; ill planned inasmuch as abstractions—impalpable to the boy—have been substituted for the concrete, book-learning for practice. No boy ever learnt cricket from a book, but many cricketers would enjoy a demonstration of the mathematics and mechanics of their game. At last, in secondary schools, it is now recognized that science must be a part of every boy's education; in Cambridge therefore we expect all poll men to pass the "Preliminary Scientific." The science brought up from the schools is far better than it was; but of his own language the boy is more ignorant than ever; he is worse in so far as he brings with him a second-rate journalese instead of that spontaneous vernacular formerly his own.

## ALL TEACHING BASED ON PRACTICE.

The innermost need of practice, to develop the educational tree in root and stem, should guide all our methods. I have said elsewhere that in its exercise the hand seems to achieve a little more than its mental message; it explores, and in each new use or adventure discovers a somewhat wider range of function and choice than the will had dictated.\* "Things outward draw the inward quality after them." Without these tentative excursions it seems that development of faculty, and of its instruments, either does not occur, or occurs in much less measure and substance. The boy, bewildered by a table of triangles and ciphers, would be delighted to survey the back garden. Whether in medicine, law, or religion, our individualist folk desire "applied" before "pure" intellect.

## THE DIPLOMA.

It is for this reason that I think the diploma student would do best to begin his first year's medical course with anatomy. By this study the hand, eye, and mind are trained together; and the minute precision, symmetrical complexity, and exquisite adaptation of every part in a consummate whole call forth a like perfection of observation and record. Upon this, as sure foundation, can be built some wider conceptions of morphology, evolution, and physiological function; anatomy and physiology being studied as two aspects of one subject.

## THE UNIVERSITY DEGREE.

For the larger or university course, the student with ampler means in time and money will provide himself with a larger groundwork; he will give time first to the study of Physics; especially to mechanics, optics, molecular processes—such as osmosis, catalysis, interface actions, and so on—and electricity; studies essential to comprehension of life, of records, of functions, and of therapeutics; if these studies are to be carried to university standard. And so on for the later subjects, for biochemistry, pharmacology, and the rest. But this extended course means from six and a half to seven years' pupilage.

## BAD SECONDARY EDUCATION.

But whether the student undertake the shorter utilitarian course, or the longer academic, it is essential that he should be equipped with a good general education, and I repeat that it is here that we find our pupils so sadly wanting. A boy learns latin, let us say for ten years, yet at the university he betrays at once his innocence of the derivation and pronunciation of the simplest technical terms of his professional studies. Not that this matters essentially; a good school education can be given without either latin or greek; the undergraduate may know nothing about Plato, Aristotle, Thucydides, or even Hippocrates, but he may know something of Newton, of Locke, of Hume, and of Mill: still as we know that "Classics" are taught after a fashion at school, and that modern philosophy and English literature are not, we suspect that, if he hardly knows the names of the great ancients, neither is he conversant with great ideas, or with history in any age; not even in his own. Can we be surprised then that an eminent scientific teacher recently declared "that education and culture need not be associated with bygone civilizations"? Even on the science side, what would ethnologists, psychologists, nay even anatomists, say to that? But it is true that modern languages and literature, treated seriously, can form a sufficient training for a profession; at the least let the schoolboy be taught his own language: now he almost always leaves school barbarous, whether in the use of his own tongue or in the knowledge of English history, scientific or literary.

\* C. A., loc. cit., p. 18.

## THE IMAGINATION, ITS KINDS.

We must lay the more stress upon general education as we see that intensity of particular study, for which I suppose we must use the ungainly word "specialization," must be the lot more or less of all of us; of it I will speak presently. But it is of the utmost importance, before this contraction of field comes about, that the youth should be trained in his imagination, a faculty which at school lies almost dormant. Yet the intellect and the imagination are the two chief coefficients of mind. Now the imagination is of two kinds: the creative and the abstractive; as of Dante and of Galileo, as of Hardy and of Darwin; the one potent in art, the other in science. As the abstractive imagination will find more nurture in a scientific calling, for these boys perhaps the creative should be nourished at school on the stories of great men, great events, and great thoughts; whether "classical" or "modern." How much more fertile is the mind endowed with imagination of either kind we see in every laboratory. Not only so, but those who have less of this animating and constructive endowment need at least so much culture as to open their eyes to the best. The second-rate comes and goes with us continually; it rises and falls, is courted and neglected; the first-rate rises slowly, and needs some inspiration to conceive it, but it abides; surely withstanding not only the treachery or indifference of men but fire also, the moth, and the edge of the sword.

Even analysis has its relation to form; almost as soon as we can observe carefully and accurately we must begin to select, and as we select we depend on the imagination for tentative concepts, and for some vision or order. For instance, let us remember that diseases are not "morbid entities" but states of many persons, multitudinous states, no two alike, but of which we form general concepts; there is no such thing ("entity"), for example, as typhoid fever—which is a concept, a necessary figment of the imagination. Again, in Medicine, we have continually to act on probabilities, probabilities divined by observation and sagacity; and we shall judge well or ill as we have built our concepts well or ill; that is, as the harvest of eye and imagination is rich or poor, crude or cultivated. If the imagination is animating and enlightened so the subordinate faculties will be led forth, and take each its own place. Now this quality in both kinds depends on some occupation with both the matter and the manner of great authors, literary and scientific; that is, on "General Education."

## SPECIALISATION.

The harm then of "specialisation," the scorn of "the school of infinitesimal research," lies not in Nature but in narrowness of the student's mind, be he old or young. Enter into the realm of nature by whatsoever gate you please, you will find yourself in the presence of infinity. If the mind of the student is dwarfed it is because of his short sight, not for lack of horizons. If, on entering into practice, the student qualifies as a "specialist" by falling into ignorance of all else, his pretension is vain; if he is to look his problems fully and intelligently in the face, he must take up the all else into that special study. Unless perhaps in respect of a few clever devices of handicraft, this means an academic education. A critical and flexible judgement comes of a familiarity with, and an appreciation of, the relative values of ideas, present and past. The examination candidate begs his coach to tell him how to answer, but not for heaven's sake to explain the reasons of the answer. He wants knowledge which can be sawn into planks for the examination platform. The harm of specialism lies then not in a limited field, this it is not; no side or adit of nature is limited; but because the specialism is reached not by carrying the whole into the part, but by stopping short at the turn.

For this reason in Cambridge we have declined to grant Diplomas on subjects which belong to the ordinary course of instruction; such as diseases of the eye, tuberculosis, and so forth; with us they are restricted to subjects lying outside the ordinary curriculum, such as Tropical Medicine, Public Health, or Mental Diseases.

## EXAMINATIONS.

To close this chapter without some allusion to *Examinations* would be to forget a very serious part of the burden of Medical Education. How to secure the unquestionable gains of these tests without the evils of them is a dilemma of which no one as yet has ventured to propose a solution. The question is, How much of an evil may it be necessary to tolerate? The three chief Examinations, with some three more subordinate, impose a great strain on the student by concentrating into a few severe and intense trials at long intervals tests which might and ought to be more gradual and continuous, and better integrated with regular work. To keep up a number of subjects at *examination pitch*, as a conjuror keeps many balls in the air, is a very exacting effort. The harass and anxiety of them waste some of the energy which ought to be devoted to calm and assiduous work; to be returned from one of them means also a serious setback in time and expense. This is not the place to offer an alternative method, even were so difficult an undertaking possible for me. But the relief will have to be made by throwing more responsibility on the teachers for frequent and formal class examinations, by requiring the students' notebooks from laboratory and ward to be submitted under proper guarantees to the qualifying body; and so forth. In Cambridge, more than once, we have suggested to outside teachers that the clinical notebooks of the students should be submitted to us, but the answer is that at present there is no organization to carry out such a system.

## RECIPROCITY IN MEDICAL SCHOOLS.

In conclusion I desire to ask the hospital schools in London to consider the great advantage, both to themselves and to their students, of free access from one school to another; of an intercollegiate reciprocity. Why should not a student of one school, duly accredited by card, be permitted freely to visit the clinics or lectures of another? The loyalty of a student to his own hospital would not be sapped by availing himself occasionally of certain courses of another; particularly in special subjects such as cardiology, neurology, tuberculosis, and so on. Do not let us flatter ourselves: his loyalty depends more on the school football than on our lectures. The fee difficulty could easily be arranged at a Clearing Office. By such free opportunities the active and competent teachers would be encouraged, and perhaps the natural powers of some of them aroused; the good teacher would draw larger classes, the less capable would be amended, or lose artificial protection. The student on his side would have his views enlarged, and his mind furnished, by the various gifts of various teachers. Each school has its strong points, each its incidental advantages. *Non omnia possumus omnes*. Moreover, there are certain subjects, such as the History of Medicine for example, which cannot, or need not, be comprehended in every school, but, if established on the open system in one or two, would do much to further medical culture.

But, after all our preparations, we have to counsel our pupils that "It is impossible you should take true root but by the fair weather that you make yourself; it is needful that you frame the season for your own harvest."\*

\* *Much Ado*, I, 3.